HORSE SPECIES SYMPOSIUM: URBAN STUDENTS IN ANIMAL SCIENCE AND THE IMPACT OF EQUINE PROGRAMS

0822 Making animal sciences relevant to the urban student: Connecting to the real world.
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The current Animal Science student is not from an agricultural background and is female. Learning requires information be assimilated onto a conceptual framework. Coming from nonagricultural backgrounds makes it more difficult for students to create the conceptual framework around animals and livestock on their own without help from the instructor. Both experiential and active learning approaches are needed to create context. For example, we can use laboratories, simulations/case studies, writing exercises and international activities in or outside of the classroom. Laboratories in Animal Sciences have the opportunity to utilize animals, tissues, or forages to demonstrate how lecture connects to the real world. For students who do not have a connection with livestock, the chance to interact with cattle, sheep, pigs, or horses may be their first experience with a large animal. Any exposure to or contact with animals in the context of learning is experiential and a profound life-changing event for most students. Laboratories also ensure students learn how to interact as a team to achieve some outcome. The interplay between students in these teams allows the construction of new contextual information so critical in long-lasting learning. Simulations and case studies provide an increase in student motivation to learn by creating a "need to know" situation. While expensive initially, simulations and cases can be used in subsequent years without the initial investment or need to maintain animals. Writing exercises as a required skill in any occupation can also provide a means for students to think more deeply on a subject and create their own connections to the real world. International agriculture increasingly is becoming the focus of not only commodity sales but also direct competition for the US agriculture economy. The classical method of travel to an international destination is out of the economic reach of many Animal Science students. Case studies can have students solve problems in a foreign culture/environment and so gain novel solutions but also international competency. A key impediment to learning is not seeing anyone who connects with them as a role model or presents a point of reference for them to aspire to or that is even relevant. Female students may not see themselves as animal scientists as they only see and hear male instructors. Animal Science must remain sensitive to the needs of society and Animal Science students if it is to retain relevance in the future.

Key Words: experiential, active, learning

0823 Creating hands on learning opportunities for inexperienced equine students.
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Universities across the country offer equine-related classes to a diverse population of students. National trends indicate that 80–85% of these enrolled students are female, and more than 50% are from suburban or urban backgrounds. Career goals for most of these students require firsthand experiences with animal care, behavior, and management. Students interested in marketing and sales of animal health-care products or retail merchandise also require knowledge of animal husbandry. Approximately 65% of students in Animal Science programs, particularly those of urban backgrounds, have little to no experience with horses and thus require experiential learning opportunities.

The Animal and Veterinary Sciences Department at Clemson University offers Pre-Veterinary Sciences (60%), Animal Agribusiness (20%), and Equine Business (EQUI; 20%) concentrations. The latter two require a minor in Business Administration, therefore combining a foundation in animal science with business courses. EQUI is aimed at students who wish to enter any facet of the horse industry that typically does not require an advanced degree. Most students enter the work force directly onto a horse farm or indirectly in allied animal health industries, marketing positions for manufacturing, feed mills, or pharmaceutical companies or through supporting careers such as lawyers, horse associations or councils, public and higher education, and more. Students enrolled in EQUI have a diverse background; some have substantial horse experience and others have none. Therefore, it is important for faculty to provide the much-needed experiences required for successful job placement.

Courses required to meet these needs should be founded in experiential learning, utilizing live animals to provide these hands-on experiences. Formal courses and laboratories, volunteering, interning or working at a horse farm, being a working student, or enrolling in a farm immersion practicum are options. Faculty must learn their students' strengths and weaknesses to offer suggestions on the types of experiences that are required to strengthen their resumes and gain more horse experience. From basic horse handling and health care skills to working with a wide variety of production phases, creating unique individualized experiences is a must. To be successful in doing this, faculty need an organized system of integrating students from a varied background and have a diverse teaching style to cater to all students. Faculty are encouraged to develop efficient and achievable goals for students who have very little experience to provide relevant and less overwhelming experiences that align with their goals.

Key Words: horses, experiential learning

0824 Retaining urban students in animal science: The role of equine programs. J. A. Sterle* and H. D. Tyler, *Iowa State University, Ames*.

The influx of non-traditional, urban students into Animal Science programs in recent years is well documented. While there are slight differences in the percentages of urban students between programs, the trend has been steadily increasing and is often the cause of increased enrollment in Animal Science programs across the country. Many of these students also indicate a primary interest in veterinary medicine. Sometimes, once exposed to the realm of Animal Science, these students are lost to other majors. Many leave because they do not find a "home" in Animal Science; for others, it may be too much emphasis on the traditional livestock species for their liking. However, for those who remain, opportunities abound. Current placement rates of Animal Science graduates at ISU are 98% within 6 mo of graduation. So, the question is: How can we convince urban students, many of whom are high achieving, driven, and intelligent, to remain in Animal Science and one day contribute to the Animal Science industry (even in other species)? The most obvious answer is to make Animal Science more relatable to their interests early in their academic career, and one bridge for that may be equine courses and activities. Freshmen entering Iowa State University's Animal Science program in the fall of 2015 ranked horses second out of all species, with 30% (of 315 responding) citing equine as the primary or secondary interest. The species with the most initial interest from this group was companion animals/household pets (54% ranked companion animals first or second). Anecdotally, it is the urban students who list companion animals first and often list equine second and vice-versa. The current Animal Science curriculum at ISU requires sophomore students to choose three courses from a directed list representing each species (Beef Cattle Science, Swine Science, Equine Science, Sheep Science, Poultry Science, Dairy Cattle Science, Companion Animal Science, or Foods of Animal Origin; with Lab Animal Science to be added in fall 2016). Requiring the third three-credit course on another species often sparks interest in the additional area. Offering these type of courses early in the curriculum allows students to further define their interests while exposing them to a potential new area early enough to explore it further. Allowing students to take in-depth courses on their species of interest early in their academic career keeps them interested in their major and increases retention.

Key Words: equine, undergraduates, urban

0825 Prolonged head elevation causes mucosal IgA fluctuation in horses. J. M. Bobel*, M. R. Di-Lernia, J. R. Abbott, M. T. Long, and L. K. Warren, *University of Florida, Gainesville*.

Stress has a pronounced effect on immune cells and their ability to mount an effective defense against pathogens. Prolonged head elevation is thought to be a major contributor to the increased risk of respiratory disease associated with transportation in horses. Elevated cortisol and changes in leukocyte populations in response to transportation stress are well documented in horses. Few studies have investigated other aspects of immune function that may predispose horses to respiratory disease following head elevation. The objective of this study was to determine if prolonged head elevation affects mucosal IgA secretions and to evaluate the potential use of mucosal IgA as indicators of stress. Twelve horses (mean ± SEM, 552 ± 10 kg; 11.5 ± 1.4 y) were tethered for 12 h with their heads elevated at a height of 1.5 m to induce physiological stress. While tied, horses had unlimited access to bermudagrass hay and were offered water every 2 h. Each horse underwent head elevation on 4 occasions, each separated by 30 d. When not tied, horses were maintained on pasture forage. Nasopharyngeal flush (NPF), whole blood, saliva, and fecal samples were obtained before head elevation (Pre), immediately after (0 h), and 12, 24, and 72 h post head elevation. Cortisol concentration was measured in serum and saliva and IgA concentration was measured in NPF, saliva, and fecal water. Data were compared using mixed model ANOVA with repeated measures. Both serum and saliva cortisol were elevated after head elevation ($P < 0.0001$) and returned to baseline by 12 h post. Salivary ($P = 0.0005$) and fecal water ($P = 0.01$) IgA were elevated above Pre at 0 h post. At 12 h post, salivary ($P < 0.0001$) and NPF ($P < 0.0001$) IgA were lower than Pre. Fecal water IgA remained elevated above Pre at 12 h post ($P = 0.04$) but dropped below Pre at 24 h post ($P = 0.005$). Salivary IgA remained lower through 72 h post ($P = 0.006$), whereas NPF and fecal water IgA returned to normal by 24 and 72 h post, respectively. Prolonged head elevation induced physiological stress and alterations in protective mucosal secretions. Instability in IgA secretions may partially explain the heightened risk for respiratory disease following transportation. Persistent fluctuations in mucosal IgA suggests the time course of physiological stress may exceed that represented by the transient elevation of cortisol. Mucosal IgA secretions may be good indicators of both acute and chronic stress in horses.

Key Words: stress, immunosuppression, respiratory

0826 Effect of a square-toe or perimeter-fit horseshoe on quality of movement and gait kinematics of the western pleasure horse. P. Q. Underwood[1], L. M. White*[1], K. W. Walter[2], D. Hogue[1], and L. K. Hirtz[2], [1]*New Mexico State University, Las Cruces,* [2]*Truman State University, Kirksville, MO*.

Hoof-care professionals often manipulate the thoracic hooves of the western pleasure horse by squaring the toe and moving the horseshoe caudally on the hoof capsule, which is thought to shorten the point of breakover, allowing for a flatter knee and more extension out of the shoulder during the swing phase. Manipulating the shape of the shoe in this way may compromise hoof capsule integrity and could contribute to chronic lameness. Our objective was to evaluate gait quality and kinematics of the western pleasure horse shod with a square-toe aluminum shoe (ST) in comparison to a perimeter-fit aluminum shoe (PF) on the thoracic digit. Quarter horses (n = 9; 5 geldings, 4 mares; 8.4 ± 1.9 yr; 545.9 ± 34.8 kg) trained in western pleasure were utilized in an 85-d repeated measures study and randomly selected on Day 1 to be shod with either an ST or PF shoe for 6 wk, then reshod with the opposing treatment on Day 43. Horses were videoed being ridden at the walk, jog, extended jog, and lope for 3 repetitions over 50 m on Days 15 and 57 wearing each treatment. EquineTec® software was used to evaluate humeroradial extension measured as the minimal elbow angle (extension out of the shoulder) at the end of the swing phase, metacarpal flexion measured as the minimal carpal angle (knee action), and metacarpalphalangeal flexion measured as the minimal fetlock angle (lower leg action), both at the beginning of the swing phase. Equine judges (n = 11) assessed quality of movement by scoring each gait from −1.5 (extremely poor) to 1.5 (excellent), where 0 was considered average. The PF treatment improved quality of movement for some parameters, including humeroradial extension for all gaits ($P < 0.034$) and metacarpal flexion for all gaits ($P < 0.0132$) except the jog ($P = 0.079$). Metacarpalphalangeal flexion and judge evaluations were not different between treatments ($P > 0.3$). Kinematic evaluation revealed quality-of-movement advantages when the PF treatment was applied by allowing for more ideal western pleasure movement seen as decreased knee action and increased extension out of the shoulder, although professional judges did not score treatments differently. The PF treatment achieves equal or superior quality of movement compared to the ST, thus providing a more appropriate shoe for the western pleasure industry that may amplify the longevity of the western pleasure horse.

Key Words: horse, square-toe horseshoe, perimeter-fit horseshoe, western pleasure

INTERNATIONAL ANIMAL AGRICULTURE

0827 Carcass quality of guinea pigs: Age effects on weights, yields, and linear carcass measurements. R. Remache[1], J. Palmay[2], C. Hernández[1], I. Barba[1], V. Inca Guerrero[1], E. Ureña[2], D. Yumisaca[3], A. J. Morales-delaNuez[4], and D. Sánchez Macías*[2], [1]*Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Ecuador,* [2]*Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Ecuador,* [3]*Facultad de Ciencias Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Ecuador,* [4]*Facultad de Ciencias Pecuarias, Escuela Superior Politecnica de Chimborazo, Riobamba, Ecuador*.

Guinea pigs are used for meat production in South America, Africa, and Asia. The increased interest in this product is due to the low production price, their relatively rapid reproduction, and the large litter size. The objective of the present study was to evaluate the effect of age on weight, yield, and drip loss in guinea pig carcasses. Fattening guinea pigs reared to different ages were used: 3 months (3M, n = 48), 4 months (4M, n = 37), and 6 months (6M, n = 41). The animals were fasted for 14 h before slaughter. Live weight at slaughter (LWS), empty body weight (EBW), and hot and cold carcass weights (HCW and CCW) were recorded. The following measurements were also recorded: carcass length (L), loin length (Lo), hind limb length (F), width of the buttocks (G), lumbar circumference (LC), thorax circumference (ThC), and thorax width (ThW). Furthermore, carcass compactness (CarC) was calculated. Hot carcass yield (HCY), cold carcass yield (CCY), yields and drip loss were calculated. LWS values increased as animals got older (888 g, 1060 g, and 1168 g, for 3M, 4M, and 6M, respectively. The gastrointestinal content for the three guinea pig groups was similar, around 90 g. The lowest values of hot or cold carcass yields were observed in 3M guinea pigs (52% and 49%, respectively), and no differences were found between the 4M and 6M groups (55–56% for HCY and 53 to 54% for CCY). With respect to drip losses, expressed as percentages, the 3M guinea pig group had the highest loss (5.8%), while the 4M and 6M groups had the lowest losses (3.7 and 3.8%, respectively). L, Lo, F, LC, ThW, and G increased as guinea pigs were reared for longer times. ThC values were similar (19 cm) in all studied animals. When CarC was analyzed, it was possible to see evidence for an age effect: the 4M and 6M groups, without significant differences between them, showed approximately 30 g cm^{-1} of carcass weight vs. 24 g cm^{-1} in 3M guinea pigs. In conclusion, rearing guinea pigs from 3 to 4 months of age increases not only the LWS but also the carcass yields and compactness. However, rearing the guinea pigs from 4 to 6 months of age does not